

**REMARKS**

This Amendment, filed in reply to the Office Action dated July 15, 2008, is believed to be fully responsive to each point of rejection raised therein. Accordingly, reconsideration and allowance are respectfully requested.

**I. Summary of the Office Action**

Claims 1-20 and 31-33 are all the claims pending in the application.

Claims 1-20 and 31-33 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

Claims 1-20 and 31-33 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Yagi (JP 11-263004 A) for the reasons stated in the Non-Final Office Action dated August 14, 2007.

**II. Rejections Under 35 U.S.C. § 112, first paragraph**

The Examiner rejects claims 1, 5, 9-11, 19, and 20 alleging that the limitation “with different heights” is not supported by the originally filed specification (Office Action at page 2). Applicant respectfully disagrees.

In particular, Applicant directs the Examiner to page 29 of the originally filed specification, where it is disclosed:

the three-dimensional image formed in the present invention is an image ... having undulation in a height direction orthogonal to the plane of the support (differences of altitude, height distribution, or height gradation (for instance, undulation digitally controlled by the ink jet system so as to have a height of around several hundred  $\mu$ m from the support and have a predetermined height gradation such as a 256-step gradation (eight bits)))).

Applicant respectfully submits that the described “undulation in a height direction” with a possible 256-step gradation clearly supports “forming a three dimensional image having undulations with different heights” (*i.e.*, the 256-step gradation representing different heights). Accordingly, Applicant requests the Examiner to withdraw this rejection.

The Examiner further rejects claim 1, and in particular, the limitation “wherein said first height is acquired prior to starting said step of forming said lamination image of said three-dimensional image”, as allegedly not supported by the originally filed specification (Office Action at page 2). Applicant respectfully disagrees.

In particular, Applicant directs the Examiner to page 33 of the originally filed specification, where it is disclosed:

As shown in FIGS. 1 and 2, ... the data processing unit 12 receives original data, such as ... information of a three-dimensional object, ... obtains height gradation data (first height information), ... and outputs output data such as two-dimensional image data and height gradation data.

Next, the control unit 14 receives the output data from the data processing unit 12 and performs control of respective portions of the printer 10, in particular the ink jet head unit 16 (16a and 16b), the fixing unit 18 (18a and 18b), and the recording target member transport unit 20 (20a, 20b, and 20c).

Applicant respectfully submits that the process described above clearly supports that “first height is acquired (*i.e.*, information received by data processing unit 12 of FIGS. 1 and 2) prior to starting said step of forming said lamination image of said three-dimensional image (*i.e.*, control operations performed by control unit 14 of FIGS. 1 and 2).” Accordingly, Applicant requests the Examiner to withdraw this rejection.

The Examiner rejects claims 31-33 alleging that the limitations recited therein are not supported by the originally filed specification (Office Action at page 2). By this Amendment, as a path of least resistance, Applicant cancels claims 31-33.

**III. Response to the Amendment Under 37 C.F.R. § 1.111 filed February 14, 2008**

The Examiner states that the arguments submitted in traversal of the Non-Final Office Action dated August 14, 2007 have been considered but are not persuasive. The Examiner further provides the reasons why claims 1-20 and 31-33 remain rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Yagi. Applicant respectfully submits the following arguments in response to the Examiner's rejections.

With respect to **claim 1**, Applicant respectfully submits that Yagi does not disclose or suggests, at least: "forming a lamination image of said three-dimensional image having said undulations with the different heights corresponding to said three-dimensional object by laminating ink solid ejected using said ink jet system on said first layer image secured on said support **based on said acquired first height information**", as recited in claim 1 (emphasis added).

In particular, in Yagi, toner particles are sprayed on the liquid ink. The ink and toner particles undergo melt-solidification and are fixed on to the recording target medium to form a three-dimensional object. The presence of such three-dimensional object provides the formation of an image having undulations. Although the three-dimensional image formed in Yagi may have undulations of uneven height, the image consists basically of a single layer, and constitutes a three-dimensional object having random undulations with no regulation of height.

On the other hand, in an exemplary embodiment of the present invention, a three-dimensional image is formed by laminating ink solid with control of height such that the height of the formed three-dimensional object represents the height gradation. That is, the height of the ink solid represents the height gradation, which is controlled in accordance with height information acquired from the three dimensional object (*see* claim 1). At least for this reason, Applicant respectfully submits that Yagi does not disclose (or suggest) all the elements of claim 1.

The Examiner alleges that Yagi's use of gradation technology discloses: "fixing said lamination image of said three-dimensional image formed on said first layer image and having said undulations with the different heights corresponding to said three-dimensional object", as recited in claim 1 (Office Action at pages 3 and 4). In particular, the Examiner alleges that, although the mechanics of the present invention and Yagi differ, "Yagi still teaches controlling the amount of material added to an object (during lamination) by using gradation technology", and thus discloses the "fixing" of the present invention (Office Action at pages 3 and 4). Applicant respectfully disagrees.

In Yagi, the amount of ink laminated on the recording medium is basically added according to the ink area, *i.e.* the dot size of the ink, and the amount of toner particles to be added corresponds to the ink area (dot size) laminated on the recording medium; accordingly, "controlling the amount of material added to an object (during lamination) by using gradation technology, as taught by Yagi", as stated by the Examiner in the Office Action, is for the purpose of area modulation and not for implementing gradation in the height direction. Therefore, Yagi does not disclose or suggests: "fixing said lamination image of said three-dimensional image

formed on said first layer image and having said undulations with the different heights corresponding to said three-dimensional object”, as recited in claim 1.

For this additional reason, Applicant respectfully submits that Yagi does not disclose (or suggest) all the elements of claim 1.

With respect to **claims 2-20**, Applicant respectfully submits that these claims are patentable over Yagi, at least by virtue of their dependency on claim 1, but also for their additionally recited elements.

For example, with respect to **claim 3**, the Examiner alleges that, because “Yagi teaches that the ink melts (during fixation), this melting suggests that the particles are thermoplastic in nature” (Office Action at page 4). Applicant respectfully disagrees.

In Yagi, the ink particles are not solid when applied, and are also not solid when melted with the toner particles. Specifically, Yagi discloses that “ink head 5 receiving a printing signal prints an image on a material to be recorded by using liquid ink and the particles of the toner or the like flying from the particulate head 11 are sprayed on the whole of the printing image part by ink executed in the previous process.” *See* Yagi at Abstract. Furthermore, the toner particles are sprayed while the ink is still in liquid form (*see* Yagi at ¶ 0008).

Thus, although Yagi discloses that the toner is of a resin material which melts at a specified temperature (Yagi at ¶ 0010), Yagi is silent as to any “melting” properties of the ink. Thus, Yagi’s combination of ink and toner may occur, for example, through absorption of the ink by the toner, and not necessarily through “melting” of the ink. Accordingly, we believe that Yagi does not disclose or suggest that the ink contains a thermoplastic solid (or is thermoplastic in nature).

For this additional reason, Applicant respectfully submits that claim 3 is patentable over Yagi,

Furthermore, with respect to claims 9 and 11, the Examiner alleges that Yagi inherently discloses the limitations therein because of Yagi's use of gradation technology to control the amount of material added to an object (Office Action in page 4). Applicant respectfully submits that the Examiner has not indicated, at least, why is it inherent in Yagi "calculating as said first height information desired height information ... from the inputted two-dimensional image information" as recited in claim 9, or "acquiring second height information ... from inputted three-dimensional object information, and converting the acquired second height information based on human's visual characteristics", as recited in claim 11.

Thus, Applicant respectfully requests the Examiner to particularly indicate why these features are inherent in Yagi. Accordingly, to the extent that the Examiner relies on inherency to allege that Yagi discloses elements of claims 9 and 11, Applicant respectfully submits that claims 9 and 11 are patentable over Yagi.

Further still, with respect to claim 10, Applicant respectfully submits that, in Yagi, there is also no inherent calculation and conversion of third height information, as described by claim 10, and the Examiner does not explain how this feature is inhering in Yagi. Accordingly, to the extent that the Examiner relies on inherency to allege that Yagi discloses elements of claim 10, Applicant respectfully submits that claim 10 is patentable over Yagi.

#### **IV. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


Respectfully submitted,

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

  
Susan Perng Pan  
Registration No. 41,239

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